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large number of 'short clams' (*Venus mercenaria*) were brought into the laboratory to be used in dissection. It was the plan of the instructors to harden a portion of these in such a way that thick free-hand sections of the whole animal could be made, thus to aid in demonstration of the anatomy. To accomplish this result quickly, as we supposed, it was decided to place them directly into commercial alcohol.

About five dozen specimens were, therefore, selected for this treatment; one of the valves of the shell of each was crushed, in order to allow the fluid to penetrate freely into the mantle chambers, and the whole number was then placed in a large aquarium jar and covered with 95% alcohol. This was at about eleven o'clock in the evening of July 15th. The material was not used on the next day, and so lay undisturbed until ten o'clock of the day following, *i. e.*, July 17th, a period of not less than 35 hours. A series of thick sections was then made by one of the students in the course, Mr. N. B. Sloan, of Hillsdale College, and laid out in a dish of fresh sea-water. In order to determine the sex of the specimen so treated, a bit of the gonad was shown by him to be that of a male, in which the sex cells were not only mature but were also showing their characteristic movements in an unmistakable manner. The attention of the instructors was called to this, and the fact that the cells were alive was tested by adding a drop of corrosive sublimate at which all the movements quickly ceased.

These germinal cells were toward the interior of the visceral mass of the clam, and if the influence of the alcohol had reached them at all through the investing sheath they were at least able to resist it and to resume their normal activities under the proper conditions. Whether any of the somatic cells of the same tissues of the animal were also living, such as the leucocytes, was not tested, but even if no alcohol had reached these germ cells, yet under the adverse conditions, inasmuch as the ordinary life processes of the animal had been so long suspended, their vitality is remarkable.

It may be, therefore, inferred that as they reach maturity the spermatozoa of this lamelli-branch may possess the ability of withstanding many unusual conditions of the surrounding

water into which they may be shed. But whether it implies a long continued or a temporary vitality was not sought by us; nor was it attempted to show by experiment whether these sexual elements could withstand greater chemical changes in the ordinary sea-water than can the smaller marine Protozoa, for example. It is certain, however, that as far as this species is concerned, great promise is inherent in the spermatozoa for obtaining the necessary distribution.

J. I. PECK.

THE APPEARANCE OF THE MOON.

TO THE EDITOR OF SCIENCE: The following incident might supplement Mr. Brinton's interesting account of the different pictures different persons see in the moon. I was a member of a jury in an important case a few months ago and the members were much more than ordinarily intelligent. While out for a walk in charge of the sheriff one evening, the full moon was coming over the hills to the east, and I suggested that each man write down the impression it gave him as to size. The slips were deposited in a hat, and when drawn out the comparisons ran from 'the size of a twenty-dollar piece' up to 'twelve feet.' When near to the horizon it struck me as being about eleven inches across, and several put it about that, but the thirteen men made it all sizes, four, six, ten inches, three feet, five feet, etc. One man said it was the size of a flour barrel and another of a buggy wheel, etc.

R. L. FULTON.

RENO, NEVADA.

SCIENTIFIC LITERATURE.

Grundriss einer exacten Schöpfungsgeschichte. Von HERMANN HABENICHT. Vienna, Hartleben. No date. 136 pages, 7 folded plates.

Habenicht has been for many years one of the expert cartographers in the geographical establishment of Justus Perthes at Gotha. His competent and sincere work in this exacting field must secure him a courteous hearing if he has anything to say about the world as a whole, so much of which has come, at second hand, under his fingers; but in the collection of his essays under the above title, the fruit of nearly forty years of professional, morphological study of the earth's surface, the deference that we owe

to a senior worker is severely tried. The book claims to be the first attempt to unite the well-established facts of astro-geo- and experimental-physics, and to refer the form of continents and sea basins, mountain chains, volcanoes and earthquakes, fossils, glacial periods, etc., to a single fundamental law of nature. The argument is briefly as follows: The cooling of the earth is discarded as a cause of surface crumpling, not because the process is insufficient, but because such cooling would—it is alleged—cause only tensile and not compressive forces in the crust (a complete misapprehension of the hypothesis). Inasmuch as temporary stars have been explained as explosions of occluded gases, it is concluded that overwhelming catastrophes might thus be caused on the earth. The huge craters produced by such eruptions are most gratuitously assumed to be the means of determining the leading lines of terrestrial relief; the collapsing of the craters causes the lands to slide and wrinkle; and inasmuch as the successive catastrophes must have extinguished all forms of life, evolution is brushed aside and the Mosaic account of creation is re-established. The author's graphic skill is employed to illustrate the post-Tertiary changes of the continents in a series of six beautiful diagrams, whose absurdity would be amusing were their imaginative innocence not plaintive.

Much more might be said; but less would hardly constitute fair mention of a book that claims to be the 'outline of an exact cosmogony.'

W. M. D.

SOME RECENT RESEARCHES ON THE CHEMISTRY OF THE CELL.*

MIESCHER's untimely death, after many years of patient work, left his epoch-making researches upon the chemical composition of the sperm of the salmon still unfinished. The results contained in the paper here reviewed represent but a small part of all that he ac-

*1. F. Miescher. Physiologico-chemical Researches on the Sperm of the Salmon (contributed by O. Schmiedeberg): *Archiv für Experimentelle Pathologie und Pharmakologie*, XXXVII., 1896.

2. A. Kossel. On the Basic Stuffs of the Cell-nucleus: *Zeitschrift für Physiologische Chemie*, XXII., 1896.

complished, but this much only was it possible for Dr. O. Schmiedeberg to collect and put together from Miescher's scattered notes. Regarding the structure of the spermatozoon Miescher has little to add to his account of 1874. The head of the sperm consists of a hull and an inner substance. The hull was of alkaline reaction since it stained in decolorized cyanin, but not in methyl green. The inner substance stained deeply in methyl green. The head also contained a so-called 'Centralstäbchen,' apparently a prolongation of the tail forward into the head. No middle-piece could be distinguished.

1. *Histo-chemical Isolation*.—If the ripe, quite fresh sperm be centrifugalized, the sperm-fluid in which the spermatozoa float may be separated from them. This fluid was found to contain 0.19% organic constituents (a mere trace of albumen), and 0.75% inorganic salts, chiefly NaCl, Na₂CO₃, KCl and K₂SO₄. It is evidently a harmless fluid, analogous to physiological salt solution, in which the spermatozoa are suspended and which serves only to give the sperm-mass the necessary fluidity for ejection.

If, after removal of this fluid by Glauber's salts solution (in which the spermatozoa remain intact) the clean sperm be extracted with successive portions of water and many times centrifugalized, the tails swell and pass over into the fluid, leaving behind a sediment of sperm-heads. In this way it is possible to obtain separately heads and tails in sufficient quantities for separate analysis. Under the microscope the heads are seen to retain intact their characteristic form. Collected under alcohol they look like an inorganic, heavy, snow white powder like barium sulphate or calcium oxalate.

2. *Constitution of the Tails*.—Analysis of the substances obtained from the tails isolated in this manner show that they consist of 41.9% albumen not farther investigated; 31.83% lecithin, a body generally present in all cells but especially abundant in nerve-tissue; and 26.27% of fats and cholesterin. The fats consist of fatty acids, which occur as soaps. The tails contain no nucleic acid or protamin. In a letter to W. His the author writes: "The farther I go with the tails, the more probable it seems to me that we have before us essentially